

REMARKS

The present Amendment is in response to the Office Action having a mailing date of February 11, 2004. Claims 1-42 are pending in the present Application. Consequently, claims 1-42 remain pending in the present Application.

In the above-identified Office Action, the Examiner rejected claims 1-42 as being directed to non-statutory subject matter. The Examiner also rejected claims 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, and 35 under 35 U.S.C. § 103 as being unpatentable over U.S. Patent No. 6,230,231 (DeLong) in view of U.S. Patent No. 5,852,607 (Chin). The Examiner also rejected claims 2, 8, 14, 20, and 32 under 35 U.S.C. § 103 as being unpatentable over DeLong in view of Chin in further view of U.S. Patent No. 6,675,163 (Bass). The Examiner also rejected claims 4, 10, 16, 22, 28, and 34 under 35 U.S.C. § 103 as being unpatentable over DeLong in view of Chin in further view of Craig Hunt, "TCP/IP Network Administration", Second Edition, O'Reilly & Associates, Inc., 1998, page 13 (Hunt). The Examiner further rejected claims 6, 12, 18, 24, 30, and 36 under 35 U.S.C. § 103 as being unpatentable over DeLong in view of Chin in further view of Bruce Schneier, "Applied Cryptography, Protocols, Algorithm, and source Code in C", Second Edition, John Wiley & Son, Inc., 1996, page 237 (Schneier).

In the above-identified Office Action, the Examiner rejected claims 1-42 as being directed to non-statutory subject matter. In particular, the Examiner indicated that the claims were drawn to mathematical operations and simply manipulated abstract ideas.

Applicant respectfully disagrees with the Examiner's rejection. Independent claims 1 and 7 recite a method "in a computer system." Similarly, independent claims 13 and 19 recite computer-readable medial. Finally, independent claims 25 and 41 independent systems that reside in "a computer system."

Thus, the independent claims recite methods which are carried out in a computer system, a computer-readable medium that is generally read and executed in a computer system, and a system residing on a computer system. Stated differently, the present invention as recited in the independent claims may includes method(s) carried out in the context of a computer system, computer-readable medium having a program implemented by a computer system, and portions of the computer system. The method, system, and computer-readable medium do not merely recite mathematical operations or manipulation of abstract ideas. Instead, the present invention as recited in varying scope in claims 1-42 is directed to statutory subject matter.

In the above-identified Office Action, the Examiner rejected claims 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, and 35 under 35 U.S.C. § 103 as being unpatentable over DeLong in view of Chin. In so doing, the Examiner appeared to cite col. 2, line 15-col. 3, line 20; col. 5, lines 1-20; and col. 6, lines 29-60 of DeLong as teaching applying of an invertible hash function and its complement.

Applicant respectfully disagrees with the Examiner's rejection. Claim 1 recites a method for providing a hash function and its complement. The method includes splitting the item into components, each of which has a particular number of bits. Claim 1 also recites cascading the components through XOR(s) to provide a number of resultants, which include a first resultant and a final resultant. The first resultant includes an XOR of the first component and remaining cascaded components of the plurality of components. The final resultant includes only the last component and the first resultant. The method of claim 1 also applies an invertible hash function and an invertible hash function complement to at least the first resultant to provide the hash. The complement of the hash includes the plurality of resultants except the first resultant. Thus, the method of claim 1 cascades the components, then applies the hash function to the resultants of

the cascade in order to provide a new hash. Claims 13 and 25 recite analogous computer-readable medium and system claims. Similarly, claim 7 recites a method for providing a hash and its complement. The method recited in claim 7 includes splitting the item into components, each of which has a particular number of bits. The method recited in claim 7 then applies the invertible hash and its complement to at least the first one of the components. Claim 7 also recites that the after application of the hash function and its complement, the (hashed) components are provided through at least one XOR to provide a plurality of resultants. Claims 19 and 31 recite analogous claims.

Thus, using the methods, computer-readable media, and systems recited in claims 1, 7, 13, 19, 25, and 31 can provide hashes of a varying number of bits. Specification, page 18, line 21-page 19, line 8 and page 30, lines 7-16. Moreover, collisions in the hashes can be resolved without accessing the original item. *Id.* Consequently, performance is improved.

The cited portions of DeLong describe a method for hashing an address. In particular, the cited portions of DeLong describe mapping (or hashing) a forty-eight bit MAC address to a fourteen bit cache lien index. DeLong, col. 2, lines 31-32. To do so, the cited portions of DeLong describe exclusive (X) ORing bits in the MAC address. DeLong, col. 2, lines 31-50. Thus, the hash of DeLong is composed only of an XOR of bits in the MAC address. Applicant can find no mention of then applying an invertible hash function **and** its complement in order to complete the hash of the original item. In particular, the portion cited by the Examiner, col. 2, line 58-col. 3, line 3 describes how to *reverse* the XOR of the components of the MAC address. More specifically, the cited portion of DeLong states that calculation “performed in accordance with the described technique are advantageously reversible.” DeLong, col. 2, lines 58-59.

DeLong further describes the reversal technique as being used to “recover each element of the original address.” DeLong, col. 2, lines 61-64.

Thus, instead of applying another reversible hash function **and** its complement to provide the hash, DeLong describes how to reverse the XORing process. Applicant can find no mention in DeLong of it being advantageous or useful to add the application of another hash function to the XORing process. Thus, although DeLong does describe XORing portions of an address to provide a hash, this is where DeLong ends. DeLong fails to describe an XORing process followed by application of the hash function and its complement to resultant(s) of the XOR process. Similarly, DeLong fails to describe application of the hash function and its complements followed by an XOR of the resultants of the hash function. Consequently, DeLong fails to teach or suggest the methods, computer-readable media, and systems recited in claims 1, 7, 13, 19, 25, and 31.

Chin fails to remedy the defects of DeLong. Applicant agrees that Chin describes the use of the XOR function. However, the cited portion of Chin does not describe applying both a hash function and its complement, then performing the XOR. Consequently, if the teachings of Chin are added to DeLong, which already describes the use of an XOR, the combination would apply a hash function and perform an XOR. However, the combination would still fail to apply **both** the hash function and its complement in addition to the use of the XOR. Consequently, DeLong in view of Chin fails to teach or suggest this feature. Accordingly, Applicant respectfully submits that independent claims 1, 7, 13, 19, 25, and 31 are allowable over the cited references.

Claims 3 and 5, 9 and 11, 15 and 17, with 21 and 23, 27 and 29, 31, 33, and 35 depend upon independent claims 1, 7, 13, 19, 25, and 31, respectively. Consequently, the arguments herein apply with full force to claims 3, 5, 9, 11, 15, 17, 21, 23, 27, 29, 33, and 35. Accordingly, Applicant

respectfully submits that claims 3, 5, 9, 11, 15, 17, 21, 23, 27, 29, 33, and 35 are allowable over the cited references.

In the above-identified Office Action, the Examiner also rejected claims 2, 8, 14, 20, and 32 under 35 U.S.C. § 103 as being unpatentable over DeLong in view of Chin in further view of Bass.

Applicant respectfully traverses the Examiner's rejection. Claims 2, 8, 14, 20, and 32 depend upon claims 1, 7, 13, 19, and 31, respectively. Consequently, the arguments herein apply with full force to claims 2, 8, 14, 20, and 32. In particular, DeLong fails in view of Chin to teach or suggest the application of a hash function and its complement in combination with XORing in the recited manner.

The cited portions of Bass fail to remedy the defect of DeLong in view of Chin. The cited portions of Bass do describe the use of a geometric hash. Bass, col. 7, lines 29-31. However, there is no indication in the cited portions of Bass that it is desirable or necessary to combine the geometric hash of Bass with the XORing described in the cited portions of DeLong. Applicant also notes that the present application as well as Bass are commonly owned by International Business Machines Corporation and were both filed after November 29, 1999. Consequently, Bass is unavailable for use as a reference for a rejection under 35 U.S.C. § 103. Consequently, DeLong in view of Bass fail to teach or suggest the methods, computer-readable media and system recited in claims 2, 8, 14, and 20. Accordingly, Applicant respectfully submits that claims 2, 8, 14, and 20 are allowable over the cited references.

The Examiner also rejected claims 4, 10, 16, 22, 28, and 34 as being unpatentable over DeLong in view of Chin in further view of Hunt.

Applicant respectfully traverses the Examiner's rejection. Claims 4, 10, 16, 22, 28, and 34 depend upon independent claims 1, 7, 13, 19, 25, and 31, respectively. Consequently, the

arguments herein apply with full force to claims 4, 10, 16, 22, 28, and 34. In particular, DeLong in view of Chin fails to teach or suggest the application of a hash function and its complement in combination with XORing in the recited manner.

Hunt fails to remedy the defects of DeLong in view of Chin. As the Examiner has indicated, the cited portions of Hunt describe the use of padding. However, Applicant has found no mention in Hunt of the application of a hash function and its complement in combination with XORing in the recited manner. Consequently, DeLong in view of Hunt also fail to teach or suggest this feature. Accordingly, Applicant respectfully submits that claims 4, 10, 16, 22, 28, and 34 are allowable over the cited references.

The Examiner further rejected claims 6, 12, 18, 24, 30, and 36 under 35 U.S.C. § 103 as being unpatentable over DeLong in view of Chin in further view of Schneier.

Applicant respectfully traverses the Examiner's rejection. Claims 6, 12, 18, 24, and 30 depend upon independent claims 1, 7, 13, 19, and 25, respectively. Consequently, the arguments herein apply with full force to claims 6, 12, 18, 24, and 30. In particular, DeLong in view of Chin fails to teach or suggest the application of a hash function and its complement in combination with XORing in the recited manner.

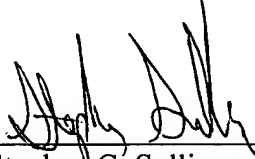
Schneier fails to remedy the defects of DeLong in view of Chin. As the Examiner has indicated, the cited portions of Schneier describe the use of transposition of messages. However, Applicant has found no mention in Schneier of the application of a hash function and its complement in combination with XORing in the recited manner. Consequently, DeLong in view of Chin in further view of Schneier also fail to teach or suggest this feature. Accordingly, Applicant respectfully submits that claims 6, 12, 18, 24, and 30 are allowable over the cited references.

Claims 37, 38, 39, 40, 41, and 42 depend upon independent claims 1, 7, 13, 19, 25, and 31, respectively. Consequently, the arguments herein apply with full force to claims 37-42. Accordingly, Applicant respectfully submits that claims 37-42 are allowable over the cited references.

Applicant's attorney believes that this application is in condition for allowance. Should any unresolved issues remain, Examiner is invited to call Applicant's attorney at the telephone number indicated below.

Respectfully submitted,

SAWYER LAW GROUP LLP

A handwritten signature in black ink, appearing to read 'Stephen G. Sullivan', is written over a horizontal line.

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